APOLLO G&N Specification
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Post-Installation Checkout Process Specification
For The Apollo Guidance & Navigation System (Spacecraft 14, MSC)

Record of Revisions

Date	Revision Letter	TDRR No.	Pages Revised

This specification consists of pages 1 to 23 inclusive.

APPROVALS	NASA/MSC		ACED

1. INTRODUCTION

1.1 The individual Spacecraft (SC) installed Guidance and Navigation (G&N) System to be checked out per this process specification shall consist of one each of the following major assemblies:

Assembly Name	NAA Drawing No.
Equipment Install-Block I, Series 100 Guidance & Navigation, LWR Equip. Bay	V16-724013
Equip Install - Block I G&N Main Display Console	V16-724006

1.2 The G&N System herein shall be identified as a Block I, Series 100 AGE 101 system and is modified by utilizing a Series 100 computer. The computer contains the SUNSHOT programs in the core rope memory modules.

2. SCOPE

2.1 This specification outlines the checkout requirements for the G&N System installed in the Apollo Command Module, Spacecraft 014 at Kennedy Spacecraft Center, Florida.

3. APPLICABLE DOCUMENT

3.1 Documents required by this specification.

3.1.1 When the requirements of this specification conflict with the drawing requirements, the drawing requirements shall have precedence.

ATP 1026000	Pre-installation Assembly Test Procedure for the Apollo Guidance and Navigation System, P/N 1015000, Block II, Series 100
FTM 1026000	Final Test Method for G&N System
ICD MH01-01220-216	Intercom Diagram - AGC to ACC Daky (Main Display Panel)
ICD MH01-01224-416	Attitude Error Signals
ICD MH01-01225-416	Total Attitude Signals
ICD MH01-01226-200	Central Timing Equipment Sync. Pulse
ICD MH01-01227-216	G&N Electrical Input Power
ICD MH01-01228-416	G&N Data Transmission to Operational Flight Telemetry Equipment
ICD MH01-01236-200	ACE Uplink/SC Digital Up-DATA Link AGC
ICD MH01-01237-216	G&N Hold Attitude
ICD MH01-01242-416	G&N Condition & Display Lights
ICD MH01-01249-416	G&N-Thermal Requirement
SID 63-512	Apollo Command Module/Service Module Measurement Requirements for SC 012/014
MA0201-0499	ACE-S/C Computer Subprogram
MA0201-0831	Program Requirements SC 014
MA0306-0047	Component Installation Procedure - Apollo Guidance Equipment S/C 014

3.1.1 (Continued)

MA0201-3179	Post Installation Checkout Process Specification for PIPA Scale Factor Determination - Apollo Guidance and Navigation System (Confidential Spec)
MA0610-018A	Contamination Control - Apollo Command Module and Service Module
MA0201-5036	Alignment of Optical Target USE on Spacecraft
SC 014, Block I, Series 100, AGE	Acceptance Data Package

4. MATERIAL AND EQUIPMENT

4.1 The following test equipment shall be used to perform the requirements of this specification. If protection to personnel and equipment is not decreased, items except government furnished parts, equivalent to those listed may be used.

Item	Quantity	Description
1	1	Carry-on Receiver and Baseplate Unit,
2	1	Carry-on Baseplate Unit, Model No. C14-201
3	1	Junction Box ACE S/C Carry-on, Model No. C14-202
4	1	Carry-on ACE S/C Response System Support Rack, Model No. C14-203
5	1	Support Frame Carry-on DTCS, Model No. C14-204
6	1	Carry-on PCM System, Model No. C14-210
7	1	Digital Signal Conditioner and Multiplexing Unit, Model No. C14-211
8	1	G&N Signal Conditioner and Switching Matrix, Model No. C14-213
9	1	External Digital Test Command Unit, Model No. C14-241
10	1	Data Interleaver System, Model No. C14-232
11	1	S/C Ground Power Supply, Model No. C14-418
12	1	Breakout Box - Test C/M-S/M Adapter, Model No. C14-467
13	1	Electrical Cable Set, Model No. C14-476
14	1	PSA Tray Extender Set 1900806-011, Model No. A23-100
15	1	PSA Test Point Adapter, Model No. A23-167

4.1 (Continued)

Item	Quantity	Description
16	1	Electrical Compensation Temperature Transducer (ECTT) Model No. [illegible]
17	1	PSA Adapter Module, Model No. [illegible]
18	1	Volt Ohmeter Simpson, Model No. 260 or equivalent
19	1	Calculator (Friden or equivalent)
20	1	E-Memory Zeroing Tape No. F04C014-ED0012-00
21	1	Stopwatch
22	1	G&N Polarity Test (System Level Only) F04C014-ED0019-00
23	1	Shorting Plug No. 45A7P2
24	1	Electrical Cable Portable G&N System, Model No. A23-097 C14-462
25	1	Optics Supporting Fixture, Model No. A14-135
26	1	G&N Installation Qualification Fixture, Model No. A23-097
27	1	SCT Resolution Check Card
28	1	DKM-3 Theodolite
29	1	Retroflecting Prism 1019840, Model No. A23-200
30	1	Movable Optics Target
31	1	Portable Light Assembly (Light Scanning Telescope)
32	1	Electronic Counter with Preset Counter (Hewlett-Packard 5245L with 5254A Preset or equivalent)
33	1	Extender Cable Set
34	1	Flexible Driver TM-62A

4.1 (Continued)

Item	Quantity	Description
35	1	[illegible]
36	1	[illegible]
37	1	ARC Alarms and Telemetry Test Tape, No. [illegible]
38	1	Global Priorities Test Tape No. [illegible]

5. GENERAL REQUIREMENTS

5.1 Safety Requirements

5.1.1 Operator Safety

5.1.1.1 Normal safety precautions shall be observed throughout the G&N post-installation checkout.

5.1.2 Equipment Safety

5.1.2.1 To preserve the operational life of the components of the G&N hardware under test, settings and adjustments shall be performed only when specified in the test procedure. Care shall be exercised in the accomplishment of all settings and adjustments to avoid excessive wear and damage to the equipment. All precautionary measures stated throughout the test procedures shall be strictly adhered to.

5.1.2.2 Prior to the electrical connection of the G&N System to the spacecraft harness, a complete verification of spacecraft power, to include both voltage polarity and magnitude, shall be completed to preclude damage to the G&N due to incorrect power application.

5.1.2.3 In no event shall the ICTC be disconnected from PGA Tray 7 except when specified to do so in a specific test.

5.1.2.4 The generation of noise alarm indication, as evidenced by one or more Noise Peak Event Lamps becoming lighted shall be cause for immediate determination of effects on G&N System Test in progress. In the event of detrimental effects on the system test, a troubleshooting routine shall be entered to determine the cause of the alarm. Testing shall continue only after demonstrating that the cause of the noise alarm has been located and that remedial action has been or will be taken, or that the transient ornoise causing the alarm has no detrimental effect on the G&N System test in progress.

5.1.2.5 Failure of the G&N System to pass any examination or test specified herein shall tentatively classify the G&N System as non-conforming. Normal test sequence may be continued upon determination of the cause of the non-conformance or at the discretion of the G&N contractor test team if not detrimental to the G&N System or other interfacing subsystems. All non-conformances shall be investigated and cleared by waiver (F.N.N.), correction of specification, or hardware replacement and retest. The suspected malfunctioned hardware shall be removed and returned to the laboratory where the malfunction shall be verified. Only after malfunction verification shall a flight certified replaceable element be installed in the G&N System.

5.2 Standard Environmental Conditions

5.2.1 The G&N System shall be tested under clean room class 100,000 conditions as specified in process specification [illegible], Contamination Control - Apollo Command Module and Service Module, while installed and operating in the command module.

5.2.1.1 For periods of G&N testing with the optical heads and the equipment of the SXT and SCT of the C/M G&N uncovered, or with the equipment removed, the environment shall meet at least the Class 100,000 specifications for the particle size and count. (No more than 100,000 particles 0.5 microns or larger per cubic foot with no more than 700 particles 5.0 microns or larger per cubic foot).

5.2.2 The Apollo G&N System shall interface with a qualified ECS distribution system which shall supply coolant fluid during STANDBY and OPERATE control modes with flow rates and inlet temperatures as specified in ICD NH01-01249-426.

5.3 Test Equipment Tolerances

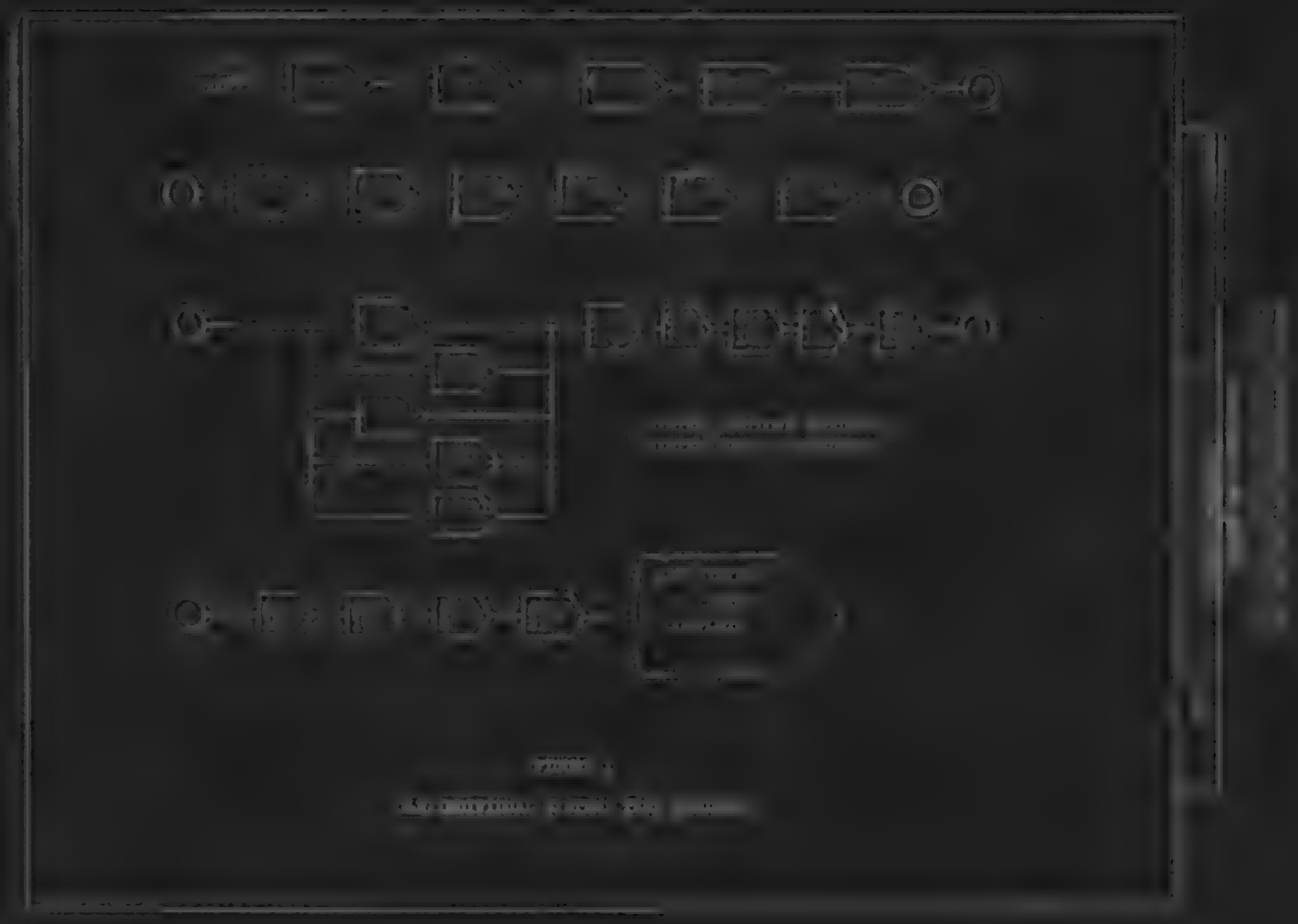
5.3.1 All tolerances specified herein do not include instrumentation uncertainties.

5.4 Test Sequence

5.4.1 The Test Sequence normally should follow the steps outlined by Code numbers in Figure I in the order specified. This normal order can be deviated on approval by the G&N Installation Unit, Department 697-506.

5.5 After the defective, replaceable element has been substituted with a flight certified unit, the G&N System checkout sequence shall regress to the rerunning of applicable portions of the selected sequence (by paragraph number) categorized by the subassembly in which the malfunction occurred. The chosen subassembly categories are presented in Table II versus an appropriate retest paragraph sequence. Retest shall be conducted by performing applicable portions of all indicated paragraph numbers in the sequence listed as indicated under the appropriate subassembly heading. Retest shall proceed to the point in the normal test sequence at which the discrepancy was detected and corrected. Normal testing shall continue beyond this point in the specified sequence of Table I.

5.6 It is assumed that the Test Conductor has a working knowledge of the test equipment used; therefore, this procedure contains only the steps related directly to the G&N System components. If any questions arise concerning the test equipment, the Conductor should refer to the pertinent operational manuals.



[illegible] this specification are attempted.

[illegible]

[illegible] other reason. This process [illegible] be performed after the G&N S[illegible] [illegible] could be limited to [illegible] to qualified spacecraft [illegible] System [illegible], Environmental [illegible] Instrumentation System [illegible] combined and integrated sys[illegible] System (SCS), Central Timing [illegible] is required for complete [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Carry-on Baseplate Gage, Model No. [illegible]

Junction Box A2Z-B/C Carry-on, Model No. [illegible]

[illegible]

Support Frame Carry-on [illegible], Model No. [illegible]

[illegible]

a. Electrical Cable Set, Model No. [illegible]

b. [illegible] Adapter, Model No. [illegible]

c. Breakout Box - Test C/M SS [illegible] Adapter, Model No. [illegible]

d. Volt Ohmmeter Simpson Model No. 269 or equivalent

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Retroreflecting Prism 1019840 Model No. A23-200[illegible]

Portable Light Assembly (SCT lamp)

5.13 Optics Power Turn On Procedure for Optical GSE Alignment Test

[illegible] with the following tests:

[illegible] Optic Positional Accuracy Test

[illegible] Prime Alignment Test

[illegible] Gyro Compassing Test

[illegible] PIPA Scale Factor Determination Test

5.13.2 [illegible] may be performed as shown in the table in Room 2, Seat Code No. 2 [illegible]

5.13.3 GSE Optics Power Turn-On

5.13.3.1 Ensure that the SCT and SXT eyepieces are installed properly on the [illegible] optics base. The optics switches and selectors on the SXT [illegible]

[illegible] SCT to SXT to SAR 10[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] PANEL Intensity to maximum increase

[illegible] Power Breaker Panel to ON position. (Breakers [illegible]

5.13.3.2 Place the CROSS-WIRE and [illegible] breakers on the POWER [illegible]

[illegible]

[illegible] the Service Module is inspected.

[illegible]

[illegible]

[illegible] 000.00 ± 0.100 degrees.

[illegible] Verify that the optics Gas Stowage Support Structure, Model No. [illegible], has been properly installed.

[illegible]

5.2.4 Perform the requirements in 6.2.7 DCS Temperature Control Test, 6.2.8 PCPA Gain Factor Determination Test, and 6.2.9 DCS Coefficient Determination [illegible] the CSM System.

[illegible]

[illegible]

6. [illegible]

6.1 Initial Test Conditions

[illegible] necessitate realignment of the inertial components.

[illegible]

[illegible] period greater than 15 minutes.

[illegible]

				to infinity

[illegible]

[illegible]

[illegible]

[illegible]

Ensure that the power connection from the [illegible] Component Temperature Controller [illegible] PTC is connected and remains connected [illegible] PSA TRAY 17 front panel connector, 45A7J2.

651-31 [illegible]

[illegible] Circuit Breaker Panel are in the OFF position. [illegible]

[illegible] Cable Set and Insert Connectors to GSE Connector [illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	2.4 ohms to infinity	
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	167 ohms to infinity	
[illegible]	[illegible]	[illegible]	11.6 ohms to infinity	
[illegible]	[illegible]	[illegible]	2.0 ohms to infinity	
[illegible]	[illegible]	[illegible]	2.4 ohms to infinity	
[illegible]	[illegible]	[illegible]	2.4 ohms to infinity	
[illegible]	[illegible]	[illegible]	2.4 ohms to infinity	
[illegible]	[illegible]	[illegible]	167 ohms to infinity	
[illegible]	[illegible]	[illegible]	11.6 ohms to infinity	

[illegible]

[illegible]

27-1416-nc0 and 27-1416-nc1.

[illegible] Polarity and voltage check on SG/GSN power

[illegible]

[illegible]

				+27.3 ±2.5 VDC
				+27.3 ±2.5 VDC
				+27.3 ±2.5 VDC
				+27.3 ±2.5 VDC
				+27.3 ±2.5 VDC
				+27.3 ±2.5 VDC
				+27.3 ±2.5 VDC
				+27.3 ±2.5 VDC
				115,±10 VAC
				115,±10 VAC

[illegible] Test Procedures

[illegible] Application of Standby Power to GNS Series

[illegible] [illegible] clara by pressing the Stand Test pushbutton on the ICCC.

[illegible] [illegible]

[illegible]2.[illegible]2 All power and control switches on the GNS Indicator and Display Panel [illegible] be placed in the OFF/or neutral position.

[illegible]

[illegible].2.1.4 Computer Power On

[illegible] [illegible] position (breakers pushed in).

[illegible]

[illegible]

[illegible]

[illegible]

[illegible].2.2.4.7 The voltage [illegible] to 1030.

[illegible]

[illegible]

[illegible] ACC DSKY indicate 00.

[illegible]

[illegible]

[illegible] to zero enable ASC memory location.

[illegible] approximately three minutes.

[illegible] and Stage+2 pitchers, respectively. Verify [illegible], R2, and R3 are incrementing.

[illegible] the following procedure.

[illegible]

5.2.1.5.1 [illegible] pushed in). Record range time.

[illegible] lighted. (CS 151)

5.2.1.5.4 Set IECC Power ON-OFF switch to ON position.

[illegible] procedures until the PTC 0x7 ALARM marker is reached in.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

6.2.1.5.11 [illegible]

6.2.1.5.12 [illegible]

6.2.1.5.13 [illegible] the test of 6.2.3, AOC Operation Test [illegible] period.

6.2.1.6 Temperature Control Loop Tests

[illegible] Panel is set to AUTO OVERRIDE Position.

[illegible]

[illegible]

[illegible] Displayed on CRT.

[illegible]

[illegible] EPIC Temperature Bridge Gain Test

[illegible] Test. The [illegible] condition lamp shall be lighted.

[illegible].2 The [illegible] Temperature Indicating Bridge Amplifier output shall be [illegible] Displayed on CRT.

[illegible] FIPA Temperature Bridge Calibration Test

[illegible] Displayed on CRT.

[illegible] FIPA Temperature Bridge Gain Test

[illegible] 134.5°F to 135.6°F.

[illegible] as displayed on CRT (02300).

[illegible]

[illegible] The FIPA Temperature [illegible] 126.0°F to 134.5°F.

[illegible]

[illegible] in less than 15 minutes.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] Battery Power Pack.

[illegible] limited.

[illegible]

[illegible] Verify current reading on zero current meter is two ± 2mv [illegible]

[illegible] Vs 1 reading on the Right Hand Thrust Chamber Panel (Greater than 1%). Reset zero adjust if it is changed.

[illegible]

[illegible] pressures and current shall be recorded.

[illegible] (crzero, crzpo).

[illegible]

[illegible]

[illegible]

[illegible] (only when current is applied).

[illegible]

[illegible]

6.2.2.1 [illegible]

[illegible]

[illegible] be followed in the order specified. Failure to adhere to this procedure may require recalibration of the thermal compensator.

[illegible] Verify or place the [illegible] switch on the [illegible] panel to the [illegible] position.

6.2.2.1.2 [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] Obtain [illegible] memory [illegible] to zero erasable AGC memory locations.

[illegible]

[illegible]

[illegible]

[illegible]

Lamp on AGC Panel No. 10 and FAILURE DETECT Lamp on Event Module 4A3 will light.

[illegible] [illegible] of DSKY will display contents of SCOUNT, SCOUNT +1 and SCOUNT +2 [illegible]

[illegible]

6.2.2.2.18 [illegible]

6.2.2.2.19 [illegible]

6.2.2.2.20 [illegible]

[illegible]

[illegible]	[illegible]	[illegible]
[illegible]	+120 VDC DOS Supply	+112.8 to [illegible] VDC
[illegible]	+12 VDC IRIG Supply	+[illegible] to [illegible] VDC
[illegible]	+32 VDC IRIG Supply	+25.5 to +35.5 VDC
[illegible]	+120 VDC PIPA Supply	+107 to +185 VDC
[illegible]	+32 VDC PIPA Supply	+25.5 to +35.5 VDC
[illegible]	-28 VDC ELECTRONICS	-24.3 to -33.7 VDC
[illegible]	DMU 28 V 800 CPS 1% 0°	+27 to +29 VRMS
[illegible]	DMU 28V 800 CPS 5%-90°	+26.1 to +29.9 VRMS
[illegible]	DMU 28V 800 CPS 5%-0°	+24.7 to +30.3 VRMS
[illegible]	DMU 28 800 CPS 5%-90°	+26.1 to +29.9 VRMS
[illegible]	DMU 2V 3200 CPS SUPPLY	2.6 to 4.2 VRMS
[illegible]	20V 3200 CPS SQ WAVE	+15.6 to +24.4 VRMS
[illegible]	DMU 2.5V 25.6 KC 1% [illegible]	+2.1 to +2.9 VRMS
[illegible]	+2.5 VDC T/M REFERENCE	+2.45 to +2.55 VDC
[illegible]	OPTX 28V 800 CPS 1%-0°	+27 to +29 VRMS
[illegible]	OPTX 800 CPS 5%-90°	+26.1 to +29.9 VRMS
[illegible]	OPTX 2.5V 25.6 KC 1% [illegible]	+2.1 to +2.9 VRMS

[illegible]

6.2.2.2.23	Enter and [illegible] pushbutton on the [illegible] after [illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
6.2.2.2.26	Perform 6.2.6 (All Operational Test		

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

6.2.3.2 AC Interface Check

[illegible] the DEXT test.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

followed throughout the test

[illegible]

[illegible]

[illegible] tape stops.

[illegible]

[illegible] stops.

5.2.3.3.4.5 Verify RL initiates 00003 on CRT.

[illegible] tape stops.

[illegible]

[illegible]

[illegible]

[illegible] stops.

[illegible]

[illegible] tape stops.

5.2.3.3.5.4 Verify RL initiates 00005 on CRT.

[illegible]

[illegible] Verify [illegible] on [illegible] (or 5026). Disregard all other [illegible] errors [illegible].

NUMBER [illegible]

6.2.3.3.6 Parity Fail

[illegible] tape stops.

[illegible]

[illegible] tape stops.

[illegible]

6.2.3.3.7 [illegible] FAIL ALARM

[illegible] tape stops.

[illegible]

[illegible]

6.2.3.3.7.4 [illegible]

6.2.3.3.7.5 [illegible]

[illegible]

6.2.3.3.8 Check Fail

[illegible]

[illegible] YES 21 [illegible] 01 [illegible]

[illegible]

[illegible] Press ERROR RESET on [illegible].

[illegible]

[illegible]

[illegible]

[illegible] the following positions:

- [illegible]
- [illegible]
- [illegible] and [illegible] breakers OFF (breakers pulled out).
- [illegible]
- [illegible] and [illegible] breakers ON (breakers pushed in).
- [illegible] TOGGLE switch in A31 ([illegible]).

[illegible] position.

[illegible]

[illegible] set to the following positions:

- SLAVE COLLECTOR to REAR [illegible]
- OPTICS MODE to ZERO OPTICS
- [illegible] MODE to DIRECT
- CONTROLLER SPEED to [illegible]
- POWER and INCREMENTS to OFF
- [illegible] DEFLECT ENABLE to OFF
- [illegible] INCREMENTS to maximum [illegible]
- [illegible] TEMP MODE to AUTO OVERRIDE

[illegible]

[illegible]

[illegible]

displayed on the CRT.

[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	+112 to +146 VDC
[illegible]	[illegible]	[illegible]	+10.6 to +13.4 VDC
[illegible]	[illegible]	[illegible]	+9.5 to +10.5 VDC
[illegible]	[illegible]	[illegible]	+107 to +145 VDC
[illegible]	[illegible]	[illegible]	+25.5 to +35.5 VDC
[illegible]	[illegible]	[illegible]	+11.7 to +14.3 VDC
[illegible]	[illegible]	[illegible]	+1.88 to +4.12 VDC
[illegible]	[illegible]	[illegible]	-33.7 to -21.3 VDC
[illegible]	[illegible]	[illegible]	+2.45 to +2.55 VDC
[illegible]	[illegible]	[illegible]	2.8 to 3.2 VRMS
[illegible]	[illegible]	[illegible]	+2.1 to +2.9 VRMS
[illegible]	[illegible]	[illegible]	+2.1 to +2.9 VRMS
[illegible]	[illegible]	[illegible]	+27 to +29 VRMS
[illegible]	[illegible]	[illegible]	+26.1 to +29.9 VRMS
[illegible]	[illegible]	[illegible]	+24.7 to +30.3 VRMS
[illegible]	[illegible]	[illegible]	+26.1 to +29.9 VRMS
[illegible]	[illegible]	[illegible]	+27 to +29 VRMS
[illegible]	[illegible]	[illegible]	+26.1 to +29.9 VRMS
[illegible]	[illegible]	[illegible]	+15.6 to +24.4 VRMS

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

6.2.4.10.5 Perform 6.2.6 GAM Operational Test.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

6.2.5.2 [illegible]

6.2.5.3 [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] tighten 15 ± 5 inch-pounds torque.

[illegible] Failure Indicator Tester.

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	PAGE
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible] Verify that +28 Vdc [illegible] is applied to pins [illegible] of [illegible].

[illegible] Observe [illegible] and verify that [illegible] and [illegible] temperature indicators on the [illegible] power supply indicators are not flashing.

[illegible]

[illegible] position and PIR switch to [illegible] position.

[illegible] Press [illegible] pushbutton to clear [illegible] alarm. All [illegible] shall clear.

[illegible] Verify the [illegible] switch to [illegible] on the [illegible] panel.

[illegible]

[illegible] Observe and verify +[illegible] Vdc [illegible] three times, pressing [illegible] push-[illegible]

[illegible]

6.2.5.32.2 [illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

PIPA FAIL OR

PIPA FAIL

6.2.5.35 Gimbal Lock Test

[illegible]

[illegible] Return the [illegible] to [illegible] position after each insertion.

[illegible]

[illegible]

[illegible]

[illegible] Wait 60 seconds.

[illegible]

[illegible]

6.2.5.35.1 [illegible]

[illegible] Insert and [illegible] driving to 25 degrees. Wait 60 seconds.

[illegible]

[illegible] Insert and [illegible] Wait 60 seconds.

[illegible] not lighted.

6.2.5.36 Removal of PSA Tray Extender, Ex

[illegible]

[illegible]

[illegible]

[illegible] heater power to the IMU are not [illegible]

[illegible] in Rack range ([illegible] on [illegible] [illegible]

[illegible]

[illegible] cable connected between J2 on A23-[illegible] PSA Adapter Module and J6 on IMU.

[illegible]

6225:563 [illegible]

[illegible]

6225:564 [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

5.2.6.1 [illegible]

[illegible]

5.2.6.2 [illegible]

5.2.6.2.1 [illegible]

[illegible]

[illegible]

5.2.6.2.3 [illegible]

5.2.6.2.4 [illegible]

5.2.6.2.5 [illegible]

5.2.6.2.6 [illegible] horizontal earth rate shall be displayed in R[illegible] [illegible] 2 on [illegible]. Round these values.

16.2.6.3	[illegible]	
16.2.6.3.1	[illegible]	
16.2.6.3.2	[illegible]	
16.2.6.3.3	Enter 0000 into R1A6.	Press the ENTR pushbutton.
16.2.6.3.4	Enter 0000 into R1A6.	Press the ENTR pushbutton.
[illegible]	Enter 0000 into R1A6.	Press the ENTR pushbutton.
16.2.6.3.6	[illegible]	[illegible]

[illegible]

[illegible]

[illegible]

6.2.7.3

6.2.7.4

6.2.7.5

		0.7 to 1.60 AU
		0.7 to 25.3 AU

6.2.7.6

6.2.7.7

6.2.7.8

6.2.7.9

6.2.7.10 Propositional Mode

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

NUMBER	[illegible]

[illegible] completed and [illegible]

Lower OA Procedure before proceeding.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

6.2.8.5.2 Set "DONE TEST" to [illegible]

6.2.8.5.3 Set [illegible] to [illegible]

6.2.8.5.4 Set MODE to [illegible]

6.2.8.5.5 Set [illegible] to [illegible]

[illegible] ACE position.

[illegible]

[illegible]

[illegible]

[illegible]

$$\frac{95000}{3199.992} = 29.6666667 \text{ seconds, or less than}$$

$$\frac{[illegible]}{[illegible]} = 29.9999269 \text{ seconds}$$

62.9 [illegible] Panel Indicators and Warning Tests

[illegible] scrolling the illumination of the following lamps:

a. Optical Reticles

b. Telescope Angle Readouts

[illegible] IMU-CDU Difference Display

[illegible] COARS ALIGN Mode Lamp on IMU CONTROL Panel

[illegible] CDU Displays

[illegible] Upon completion of these tests, the lamps in the [illegible] should be illuminated and the [illegible] displays should be blank or [illegible]

[illegible] ZERO REC

[illegible] COARS ALIGN

[illegible] OFF MAN

[illegible] ATT CONT

[illegible] DATA

[illegible] DISPLAY

62.9.2.1 Release the [illegible] COARS ALIGN Lamp on the [illegible]

[illegible]

[illegible] G&N FAIL

[illegible] GIMBAL LOCK

[illegible] IMU TEMP

[illegible]

[illegible]

[illegible] MASTER WARNING

[illegible] MASTER CAUTION

6.2.9.3.1 Release CHECK CONDITION lamps pushbutton. [illegible] the Condition Annunciator Panel [illegible]

6.2.9.[illegible] [illegible]

[illegible]

[illegible] shall be extinguished.

[illegible]

[illegible]

6.2.10.4.7 Set the OPTICS MODE selector [illegible]

6.2.10.4.8 Repeat 6.2.10.4.4 [illegible]

[illegible]

[illegible]

6.2.10.5.2 [illegible]

6.2.10.5.3 [illegible] to 200 [illegible] selector at [illegible]

6.2.10.5.4 [illegible]

6.2.10.5.5 [illegible]

6.2.10.5.6 [illegible]

6.2.10.5.7 [illegible]

[illegible]

[illegible]

[illegible]

[illegible] When all signals have reached a steady state value, set the attenuation [illegible]

[illegible]

6.2.10.6.7 [illegible]

6.2.10.6.8 [illegible]

[illegible]

6.2.10.7.1 [illegible]

[illegible]

6.2.10.7.3 [illegible]

[illegible]

[illegible]

[illegible]

[illegible] Seconds [illegible] decoder clock drive as [illegible] Two seconds approximately ten seconds [illegible] transmission. [illegible] analog recorder. [illegible] on the [illegible] panel. [illegible] in a key seconds ([illegible] and by [illegible]

[illegible] Record [illegible] value or signals specifications 6.2.11.5.14

[illegible]

[illegible] The 11, 12, and 13 displays when the [illegible] pushbutton is pressed are as follows:

[illegible]

13 is time as xxx.xx seconds

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] before proceeding. Do not hold control stick at right limit for more than ten seconds

6.2.11.5.12 [illegible]

[illegible] seconds (approximately) [illegible]

[illegible]

[illegible] Shaft Angle as xxx.xx degrees

6.2.11.5.12.

[illegible]

Δ Shaft

[illegible]

6.2.11.6 Slew Rate - Low Speed

[illegible]

[illegible]

[illegible]

[illegible]

at upper limit for more than thirty seconds

[illegible]

6.2.1.6.1 Absent VES3 [illegible] recorder chart [illegible] recorder. [illegible] key [illegible] by [illegible]

6.2.1.6.3 [illegible] the respective differences between the R2 and R3 display. [illegible]

[illegible] [illegible] degrees/second.

[illegible] [illegible]

[illegible] [illegible] at right limit for more than ten seconds.

[illegible]

[illegible]

[illegible] the Medium Speed test.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

6.2.31.7 ACC Optics Alignment

[illegible]

[illegible]

[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

6.2.13.4 [illegible]

6.2.13.4.1 [illegible]

6.2.13.4.2 [illegible]

6.2.13.4.3 [illegible]

6.2.13.4.3.1 [illegible]

6.2.13.5 [illegible]

6.2.13.5.1 [illegible]

6.2.13.5.2 [illegible] 0.5 degrees.

[illegible] counter rotation, and counter rotation, on scanner [illegible]

6.2.13.5.3 [illegible]

6.2.13.5.4 Repeat 6.2.13.5.1

6.2.13.5.5 [illegible]

6.2.13.5.6 [illegible] Turn on the light.

[illegible] it would be necessary for the optics operator to communicate with the personnel outside the [illegible] and the retroreflecting prism.

6.2.13.5 [illegible]

[illegible]

[illegible]

6.2.13.5.6 [illegible]

6.2.13.5.10 [illegible]

6.2.13.5.11 [illegible]

[illegible]

6.2.13.5.13 [illegible]

[illegible] Quick to drive the 24 [illegible] and to [illegible]

6.2.13.5.15 [illegible]

6.2.13.5.16 [illegible]

[illegible]

[illegible]

6.2.13.6.1 [illegible]

6.2.13.6.2 [illegible] the central field to correct, if needed.

6.2.13.6.3 Sight through the autocollimator [illegible] the [illegible] reticle image into the [illegible] filar. Record the autocollimator reading.

6.2.13.6.4 [illegible]

6.2.13.6.5 [illegible]

6.2.13.7.10.1

6.2.13.7.12

6.2.13.7.12.1

6.2.13.7.13

6.2.13.7.15

6.2.13.7.16

Target No. 1 on A23-071. Record START and [illegible] CMU indications.

[illegible] into [illegible]. Press [illegible] pushbutton. [illegible]

6.2.13.7.19

6.2.13.7.20

6.2.13.7.21

6.2.13.7.22 [illegible] and 6.2.13.7.17 shall not [illegible] difference.

6.2.13.7.22.1 [illegible] difference.

6.2.13.7.22.2 [illegible] difference.

6.2.13.7.22.3 [illegible]

6.2.13.8 [illegible]
6.2.13.8.1 [illegible]

6.2.13.8.2 [illegible]

6.2.13.8.3 [illegible]

6.2.13.8.4 [illegible]

6.2.13.8.5 [illegible] AGC [illegible]

6.2.13.8.6 [illegible] the 2X [illegible] angle.

6.2.13.8.6.1 [illegible]

6.2.13.8.7 [illegible] the base of the SXT cycles. [illegible]

6.2.13.9 [illegible] selector [illegible]

6.2.13.10 Verify [illegible] CDU and 2X [illegible] CDU indications [illegible]

//

6.2.1.5 Course Align Mode

[illegible]

[illegible]

Panel: Disregard Jump Indication.

[illegible] align is:

1. CG 2110 DGA TORQUE MOTOR [illegible]
2. CG 2140 DGA TORQUE MOTOR [illegible]
3. CG 2170 DGA TORQUE MOTOR [illegible]

[illegible]

[illegible] 7.

Press [illegible] pushbutton.

Panel and on Event Modules may illuminate. Disregard to go otherwise.

[illegible]

Seconds.

[illegible]

[illegible] on the CRT.

Table VIII [illegible] Signal Voltage Requirements

[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	60 ± 2.5 degrees
[illegible]	60 ± 2.5 degrees
[illegible]	60 ± 2.5 degrees
[illegible]	0.0 ± 1.00 degrees
[illegible]	0.0 ± 1.00 degrees
[illegible]	0.0 ± 1.00 degrees
[illegible]	0.0 ± 1.00 degrees
[illegible]	[illegible] to [illegible] degrees

[illegible]

[illegible]

[illegible] Press ERROR pushbutton. The VERB-NOUN display [illegible]

[illegible] Press ERROR pushbutton. Verify VERB-NOUN [illegible]

4.2.1.X.6.3 [illegible]

[illegible] Voltage Requirements

[illegible]	[illegible]
[illegible]	0.0 to .200 VRMS
[illegible]	0.0 to .200 VRMS
[illegible]	0.0 to .200 VRMS
[illegible]	0.0 to [illegible] VRMS
CG 2167 MGA SERVO ERROR	0.0 to [illegible] VRMS
CG 2167 OGA SERVO ERROR	0.0 to [illegible] VRMS

	CH 2209 SCS PITCH	0.0-1.00 degrees
[illegible]	[illegible]	
	Shall be (0.0)-1.0 degrees.	
[illegible]	Verify that the K-RELAYS on CHT indicate [illegible]	
[illegible]	Insert the following into Log Book:	
	Insert VEGA 11, HDUS 20 Error.	
	Insert +00000, Error.	
	Insert +00000, Error.	
	Wait 60 seconds.	
[illegible]	[illegible] Mode/Control Node	
[illegible]	Power cycle the SCS's in the one-of-the-two CAN nodes.	
	Page the 2209 HIAMR. Console [illegible]	
	[illegible]	
	[illegible]	
	[illegible]	
	Are verified as to magnitude and polarity.	
	[illegible]	

6.2.14.7

6.2.14.7.5 Pitch Error (+5° and -5°)

Press the RUN indicator switch to [illegible]

6.2.14.7.5.2 Verify RI indicates 00001 on CRT.

6.2.14.7.5.3 [illegible] on AA-A3-CH4.

6.2.14.7.5.4 Press 5mm/sec on Analog Recorder AA-A3.

[illegible] after the transients have died out.

6.2.14.7.5.5 [illegible] Recordings.

6.2.14.7.5.6 [illegible] Record the phase.

[illegible]

Table [illegible] [illegible] Implementation

[illegible]	[illegible]
CG 2209 SCS PITCH	[illegible]
CG 2239 SCS YAW BODY	[illegible]
[illegible]	[illegible]
CG 2269 SCS ROLL BODY	[illegible]
[illegible]	[illegible]

[illegible] the [illegible] indicator of the IMU-CDU DIFFERENCE MONITOR [illegible] ±1.0 degrees.

[illegible] tape stops.

[illegible] 10 Verify RI indicates 00002 on CRT.

[illegible] must be taken immediately after transients have died out.

[illegible] tape stops.

[illegible] record phase.

Table [illegible] Overall Requirements

[illegible]	[illegible]
CG 2209 Pitch error	[illegible] degrees
CG 2239 SCS YAW BODY	(0.0 ± 1.00 degrees)
CG 2281 SCS YAW OFFSET	(0.0 ± 1.00 degrees)
[illegible]	[illegible]

Verify all [illegible] [illegible]

[illegible] Start [illegible]

NOTE: The readings on the [illegible] and [illegible] are [illegible] immediately after the [illegible] [illegible]

[illegible] Press the RUN indicator [illegible] until tape stops.

[illegible]

[illegible]

Table XII Signal Requirements

Symbols	Requirements
[illegible] SCS PITCH ERROR	[illegible] 1.00 degree
[illegible] SCS YAW OFFSET	(-5.00, +1.23, -1.37 degrees
[illegible] SCS ROLL OFFSET	144 to 166 degrees

[illegible]

[illegible] Roll error (0.0 and 0.0 degrees)

[illegible]

Error on AGC-A3-CDU [illegible]

[illegible]

tape stops.

[illegible] Verify RR indicator 0000 on CDU.

[illegible]

until tape stops.

[illegible]

be [illegible] 4.0 degrees.

[illegible]

[illegible]

ERROR on SAI-A3-CRT.

[illegible]

tape stops.

[illegible] Verify B1 indicator 00003 on CRT.

[illegible]

transients have died out.

[illegible] stops.

[illegible]

Table [illegible] Signal Requirements

[illegible]	[illegible]
CS 2269 SCS PITCH ERROR	0 [illegible] degrees
CS 2239 SCS YAW RATE	[illegible]
CS 2241 SCS YAW ERROR	[illegible] degrees
CS 2269 SCS ROLL RATE	[illegible] degrees
CS 2271 SCS ROLL ERROR	[illegible]

[illegible]

Meter shall be -5.0 to +11.0 degrees.

[illegible]

until tape stops.

[illegible]

[illegible] (44.20, 21.32, -51.14 degrees)

[illegible]

[illegible]

[illegible] degrees

[illegible] degrees

[illegible] degrees

[illegible] (44.32, -51.14 degrees)

[illegible] degrees

[illegible] degrees

Tape Stops.

[illegible] Verify BI indicator 00006 on CDT.

[illegible]

[illegible] Immediately after [illegible] Premierme [illegible]

[illegible] Verify tape stops.

[illegible]

Channel 2. Record pulse.

[illegible] in Table XIV on the CRT.

[illegible]

[illegible] DIFFERENCE Meter; small as (+5.0, -11.0 degrees.

[illegible]

[illegible] Entry Mode

[illegible] Yaw Offset Error (+5 degrees)

[illegible] on [illegible] or 2.

[illegible] until tape stops.

[illegible]

[illegible]

[illegible] immediately after the transients have died out.

[illegible] until tape stops.

[illegible] channel. Record pause.

Table IV on the CRT.

Table IV Signal Requirements

Signal	Requirements
SS 2209 SCS Pitch Error	(0.00 ± 0.50) degrees
CG 2239 SCS Yaw Error	(0.20, -0.32, -1.18) degrees

Difference Meter - The Minute Circle Indicator of the DSI-CDI
Difference Meter - The 1 Min (-2.03 ± 1.0) degrees

Error on JAI-A1-C 1 or 2

Install tape stops.

[illegible] Verify 10 indicates 00010.

Mode for 100 seconds. The DU will then proceed to

Transients have disappeared.

Install tape stops.

Pulse-channel - Record phase.

Table XVI Signal Requirements

6.2.14.8.3 Pitch Error (+5 degrees)

Verify all indicator [illegible]

the transients have died out.

the high rate channels record passes.

Sec. [illegible]

Table XVII Signal Requirements

Signal	Requirement
CG 2209 SCS PITCH ERROR	[illegible] (Zero) [illegible] degrees
CG 2239 SCS YAW BODY	[illegible] degrees
CG 2241 SCS YAW OFFSET	[illegible] degrees
[illegible]	[illegible]

5.2.1.6.4 [illegible] degrees.

5.2.14.5.[illegible] Verify that the K-BELAYS on CMT-PITB-LK indicator [illegible]

5.2.14.5.[illegible] Press the BUS Indicator switch [illegible] on panel [illegible] [illegible] CMG [illegible]

5.2.14.5.7 [illegible] MU-CMT CONTROL PANEL.

Indicate [illegible] degrees.

5.2.15 Gimbal Trigger Test

5.2.15.1 Install on TAPE READER.

The following steps on Console A6-A3 in sequence:

Press the TAPE/KEY indicator to TAPE.

Press the PRO/TEL indicator to PRO.

Press the DEP/CONT indicator to CONT.

Press the LOAD/DMP indicator to LOAD.

CG 2110 10A TM [illegible]

CG 2140 MGA TM [illegible]

CG 2170 GGA TM [illegible]

000 ± 010 degrees.

[illegible] K-140 to initiate 25 Counter-clockwise

be 000 ± 010 degrees.

6.2.15.1 [illegible]

on 000 ± 010 degrees.

[illegible] to initiate 26 Counter-clockwise Friction Test.

[illegible] 000 ± 010 degrees.

6.2.15.1 Repeat 6.2.15.5 and 6.2.15.6.

[illegible] K-140.[illegible]9 Initiate 27 Clockwise Friction Test. [illegible] Observe CMI. When MC/CMI angle stops [illegible]

6.2.15.1[illegible] Repeat 6.2.15.5 and 6.2.15.6.

remove from TAPE READER.

range of the active trace.

[illegible]

[illegible]

[illegible]

[illegible] between [illegible] and the peak of the first [illegible] the total number of overshoots.

[illegible] pushbutton.

[illegible] a 2.0 ± 0.2 VDC [illegible]

6.2.16.7 Power Circuit Response Test

[illegible]

A1-A3-C1.

6.2.16.7.2 Insert the following sequence into [illegible]

a. VOS A1, BOUT 20, [illegible]

b. +0000 [illegible]

c. +00000 [illegible]

d. +0000 [illegible]

Wait 60 seconds.

6.2.16.7.3 [illegible]

6.2.16.7.4 [illegible] are lighted.

6.2.16.7.5 [illegible]

[illegible]

Next Test Circuit Breaker Panel.

6.2.16.7.6 [illegible]

6.2.16.7.7 [illegible]

[illegible]

[illegible]

[illegible]

[illegible] 0.5 seconds.

[illegible] shall be two.

[illegible]

[illegible] VOR 31, RGB 20 [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] 03 2170 [illegible]

[illegible] 03 2177 [illegible]

[illegible] 03 2187 [illegible] SERVO ERROR [illegible]

[illegible] 03 2177 03 SERVO ERROR [illegible]

[illegible] recorder shall be for duration of this test.

[illegible]

[illegible]

0005 [illegible]

[illegible]

[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

6.2.17.6 During the following operation, Hardware [illegible]

[illegible]

- [illegible]
- [illegible]
- [illegible] to zero, VRM 07 and ROM 30 will [illegible] indicates completion of one of the [illegible]

[illegible]

6.2.17.8 [illegible] the RESET switch on the LEM AGC DSKY.

6.2.17.9 [illegible] Table XVIII have been utilized.

6.2.17.10 [illegible]

[illegible] [illegible] 0 seconds.

6.2.17.10.2 [illegible]

6.2.17.10.3 [illegible] after each entry.

[illegible] Perform the following calculations:

a. X IRIG Scale Factor Error:

$$\frac{K_I - S}{S} \quad \Delta K_{av} \quad \frac{S}{S} \quad \Delta K_r$$

[illegible] parts/million

[illegible]

[illegible] parts/million

6.2.17.12 [illegible]

6.2.17.12.1 [illegible]

6.2.18 [illegible]

6.2.18.1 [illegible]

[illegible]

[illegible] proceed to 6.2.18.11.

[illegible]

a. VERB 21 [illegible]

b. [illegible]

c. VERB 22 [illegible]

d. 42823 (Correct IB latitude) [illegible]

e. VERB 33 [illegible]

Page 6-2

[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

[illegible]

[illegible] Enter +00000 into R146. Press the ENTER pushbutton.

[illegible] Enter +00000 into R145. Press the ENTER pushbutton.

[illegible] [illegible] After some lamp shall light.

6.2.16 Calculation

5.83 cm/sec/pulse.

6.2.18.5.4 [illegible] and 6.2.18.5.2 as follows:

[illegible]

[illegible]	[illegible]
[illegible]	[illegible]

[illegible] calculations. [illegible]

[illegible] Coefficient Determination Test

[illegible] test.

[illegible] Verify or set transfer switch to CONTROL.

[illegible] Z-Axis.

[illegible] as follows:

Contents of (R1)$_i$ Contents of (R2)$_i$

A_i = ±XXXXXX XXXXX

Where i = Position Number

[illegible]

[illegible] = PIPA scale factors using five significant figures [illegible]

= [illegible].85 (local g)

Δ = 5.85 (local g)

= 5.85 (local g)

[illegible]

6.2.19.5 [illegible]

6.2.19.6 [illegible]

[illegible]

[illegible] [illegible]

a. VERB 21 NOUN 02 [illegible]

b. 01231 [illegible]

[illegible]

6.2.19.9 [illegible]

[illegible]

[illegible] [illegible]

[illegible] flashing. Record indication of R1 and R2.

NOTE: R1 should be +00000.

[illegible]

6.2.19.13 [illegible]

[illegible]

[illegible] through [illegible] panels.

[illegible]

[illegible] verify [illegible]

[illegible]

[illegible] flashing. Record indication of E1 and E2.

[illegible] 6.2.19.[illegible]

6.2.2.2 [illegible] perform 6.2.2.2 Turn on [illegible].

6.2.2.2 [illegible] shall be [illegible] proper operation of the dual optics. [illegible] subnet (Ref. No. 1) shall [illegible]

[illegible]

[illegible]

[illegible] VERB 22 [illegible]

[illegible] 00000 [illegible]

[illegible] VERB 33 [illegible]

[illegible]

[illegible] X1 → xxx.xx (-45.000 × S/C AZ degrees)

[illegible] X2 ← 00000 (TOT 2 XL, degrees)

[illegible] X3 00002 (TOT number)

[illegible]

[illegible]

[illegible] VERB 21 [illegible]

[illegible] ← xxx.xx (-45.000 + S/C AZ) [illegible]

[illegible] VERB 22 [illegible]

[illegible] ← 00000 [illegible]

[illegible] VERB 33 [illegible]

[illegible]

[illegible] X1 ← 21500 (SM A2)

[illegible] X2 ← 28516 (LGC)

[illegible] Is the [illegible] in [illegible] [illegible] since [illegible] and proceed to 6.2.20.15.

[illegible]

[illegible]

[illegible] ← 21500 (correct SM A2) [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

seconds or less.

[illegible]

[illegible]

[illegible]

6.2.21.3 [illegible]

6.2.21.4 [illegible]

[illegible]

[illegible] into RAM.

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	(Memory address)	
[illegible]	[illegible]	[illegible]	(OCTAL data)	

[illegible] 2 [illegible] required to change the [illegible] data load:

1. Perform the following calculation:

[illegible] x [illegible] = [illegible]

2. [illegible]

[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] of the three readings for each gyro

[illegible]

three times to obtain data items 3 and 4.

[illegible]

in Table 6.2.

[illegible]

6.2.21.26.3 [illegible]

6.2.21.26.4 [illegible] 21.23.1 through 6.2.21.23.3 three [illegible] the GAI input voltage to [illegible] volts dc. [illegible] values.

[illegible]

TABLE 6.2

Date:mm	X-ray Traveling Angle(DA)				X-ray Traveling Angle(DB)				X-ray Traveling Angle(DC)			
	First Peaking	Second Peaking	Third Peaking	Average	First Peaking	Second Peaking	Third Peaking	Average	First Peaking	Second Peaking	Third Peaking	Average

9

2 (2 hours)

3 (2.5 hours)

4 (3.0 hours)

5 (10 Min)

6 (10 Min)

7 (15 Min)

8 (15 Min)

APOLLO G&N Specification
ND1002324 A
Original Issue Date: 7/13/66
Release Authority: TDRR 31027
Class A Release

NUMBER					

Item (Continued)			
			Inertial Components Temperature Controller (ICTC), Model No. A23-100
			FSA Adapter Module, Model No. A23-201
			Volt Ohmeter Simpson, Model No. 269 or equivalent
			Generator (Simpson or equivalent)
			[illegible]
			Stopwatch
			CSM Polarity Test (System Level Only) [illegible]
			Shorting Plug No. [illegible]
			Electrical Cable Portable GSE system, Model No. A23-097 GSA-162
			[illegible]
			GSE Installation Qualification Fixture, Model No. A23-097
			SCT Resolution Check Card
			DKM-3 Theodolite
			[illegible]
			Movable Optics Target
			[illegible] Telescope
			[illegible] Packard 5245L with 526A Preset [illegible]
			Extender Cable Set
			Flexible Driver TM-0CA

		Description
		(or equivalent)
		Carry-on Cable Set CLA-374
		AGC Alarms and Interrupts Test Tape No. P04C014-E00020-00
		Gimbal Friction Test Tape No. P04C014-E00031-00

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

with the following tests:

[illegible] 6.2.13 Optic Positional Accuracy Test

[illegible] 6.2.20 Fine Alignment Test

[illegible] 6.2.21 Gyro Compassing Test

[illegible] 6.2.18 PIPA Scale Factor Determination Test

[illegible]

5.13.3 G&N Optics Power Turn-On

[illegible] shall be set to the following positions:

[illegible] SLAVE TELESCOPE to STAR LOS

[illegible] OPTICS MODE to ZERO OPTICS

[illegible] CONTROLLER MODE to DIRECT

[illegible] CONTROLLER SPEED to LO

[illegible] POWER and BRIGHTNESS to ON

[illegible] PANEL BRIGHTNESS to MAXIMUM INCREASE

[illegible]

[illegible] Panel to ON position. (breakers pushed in).

[illegible]

[illegible] no more than 30 seconds after optics power turn on.

[illegible]

[illegible]

[illegible]

DETAIL REQUIREMENTS

[illegible] Initial Test Conditions

[illegible] shall be observed [illegible] in inertial component performance history of the [illegible] deviation may necessitate recalibration of the inertial components.

[illegible] otherwise specified.

[illegible] Inertial Components Temperature Controller (ICTC) Model No. [illegible] 120° [illegible] while under control of the ICTC.

[illegible] After 6.2.3 [illegible]

power while in coarse align.

or when changing from coarse align to fine

seconds after inserting or

the unit power or the Mk 1Q, PRF zero. Mk 1Q shall remain in the Accuracy Position except when directed by the procedural [illegible]

In no case shall the MARK [illegible] [illegible] the indicator on [illegible]

[illegible]

[illegible]

[illegible] spacecraft power connectors [illegible]
[illegible] of spacecraft power.

[illegible]

[illegible]
pulled out.

[illegible]

[illegible] as follows in table [illegible]

[illegible]

[illegible] connector.

[illegible] C27-1A16-1190 and C27-[illegible]

[illegible]

[illegible] be within the requirements.

		CZ7-1A16J-191-	
		CZ7-1A16J-191-	
		CZ7-1A16J-191-R	
		CZ7-1A16J-191-F	

[illegible] specified otherwise as a procedural step.

[illegible] AC 3 breakers on the Right Hand Circuit Breaker Panel (breakers pushed in). Record the value [illegible] (24.5 V to 30.5V).

[illegible] AC 2 breakers on the Right Hand Circuit Breaker Panel are pushed in).

6.2.1.4.5 Set the computer numerical display [illegible] by rotating the BRIGHTNESS thumbwheel [illegible].

6.2.1.4.6 Ignore the computer [illegible] in r'148 [illegible] Press [illegible] pushbutton. Press [illegible] pushbutton. All [illegible] shall clear.

6.2.1.4.7 The voltage [illegible] shall be +1.88 to +4.12 VDC.

[illegible] the value on Cur shall be recorded.

[illegible] ADC 15RV (indicate 00).

[illegible]

[illegible]

[illegible] approximately three minutes.

[illegible] and 13, until [illegible] 100%.

6.2.1.5 [illegible] Power on and Shorting [illegible]

[illegible] 6.2.1.5.1 through 6.2.1.5 [illegible]

6.2.1.5.1 [illegible]

6.2.1.5.2 [illegible]

6.2.1.5.3 [illegible]

6.2.1.5.4 [illegible]

procedure until the PIC 17 ALARM RESET [illegible] presses it.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]	Requirement
[illegible]	[illegible]
[illegible]	25.8 to 30.8 VDC
[illegible]	0 to +0.7 VDC

[illegible]

6.2.1.5.2 [illegible] to maintain a temperature [illegible]

[illegible]

6.2.1.6 Temperature Control Loop Tests

[illegible] Panel is set to Auto Operate Position.

[illegible]

[illegible]

[illegible] displayed on CRT.

[illegible]

[illegible]

[illegible]

[illegible] displayed on CRT.

[illegible]

[illegible] displayed on CRT.

6.2.1.6.5 PTRA Temperature Bridge Gain Test

[illegible]

[illegible]

The PTRA Temperature [illegible] 134.33°F to 135.6°F.

[illegible] displayed on CRT (CC2300).

[illegible]

[illegible] 128.0°F to 134.5°F.

6.2.6.1.7 Temperature Control [illegible]

[illegible]

6.2.6.1.7.1 Remove standby [illegible] on the Rinse [illegible]

[illegible]

[illegible]

6.2.6.1.7.4 Press the 105 F [illegible]

6.2.6.1.7.5 Press the Fast [illegible] Battery Power Panel.

[illegible] lighted.

[illegible] lighted.

[illegible] (002301, 002300).

[illegible]

[illegible]

[illegible]

[illegible] only when current is [illegible]

Circuit breaker panel (breakers pushed in).

Ensure that the ACC [illegible] switch is in the [illegible] position.

b. CG 1526 +13 VDC ACC Supply [illegible]
b. CG 1[illegible] +5 VDC ACC Supply [illegible]

Breaker panel (breakers pushed in).

[illegible] lighted (CG 1513).

[illegible] ICTC ON/OFF switch in ON position.

a. Insert VERB 21, NOUN 01, [illegible]
b. Insert 00041, ENTER
c. Insert 00000, ENTER

erasable AGC memory locations.

Self Test. (Wait approximately three minutes.

Lamp on Event Module 4A3 will light.

the Conditioner Annunciator is lighted.

(OCT 5000).

* Only if 6,2,2,2,19 is performed.

[illegible]	[illegible]	[illegible]
[illegible]	+120 VDC, IMUS Supply	[illegible]
[illegible]	+[illegible] VDC, IMUS Supply	[illegible]
[illegible]	+[illegible] VDC, IMUS Supply	[illegible]
[illegible]	+120 VDC, PIPA Supply	[illegible]
[illegible]	+32 VDC PIPA Supply	[illegible]
[illegible]	-28 VDC, ELECTRONICS	-21.3 to -31.7 [illegible]
[illegible]	IMU 28 V 800 CPS 1% 0°	+27 to +29 [illegible]
[illegible]	IMU 28V 800 CPS 5%-90°	+26.1 to +29.9 [illegible]
[illegible]	IMU 28V 800 CPS 5%-0°	+24.7 to +30.3 [illegible]
[illegible]	IMU 2V 3200 CPS SUPPLY	[illegible] to [illegible] VRMS
[illegible]	30V 3200 CPS SQ WAVE	+15.6 to +24.4 VRMS
[illegible]	IMU 2.5V 25.6 KC 1% [illegible]	+2.1 to +2.9 VRMS
[illegible]	+2.5 VDC T/M REFERENCE	+2.45 to +2.55 VDC
[illegible]	OPTX 28V 800 CPS 1%-[illegible]°	+27 to +29 VRMS
[illegible]	OPTX 800 CPS 5%-90°	+26.1 to +29.9 VRMS
[illegible]	OPTX 2.5V 25.6 KC 1% [illegible]	+2.1 to +2.9 VRMS

*Only if 6.2.2.2.19 is performed.

[illegible]

[illegible] shall flash and indicate 21-22.

and ARC alarm lamps shall not be lighted.

(5.2.3.2.3) DSKY Prelaunch (Cont)

and 76352 in R3. Verify the displays.

(5.2.3.2.4) C-- Delay Check

NOTE: ACCEL FAIL, DSE FAIL, CDU FAIL and ZERO

[illegible] shall be displayed. [illegible]

6.2.3.3.2 Parity Indicates 00001 on CRT.

[illegible] step.

6.2.3.3.3 [illegible] being generated.

6.2.3.3.4.2 Verify X1 indicates 00002 on CRT.

[illegible] tape stops.

[illegible]

[illegible] stops.

[illegible]

[illegible] tape stops.

[illegible]

[illegible]

[illegible] tape stops.

[illegible]

[illegible] tape stops.

[illegible] lamp indications. Press [illegible] RESET.

[illegible] stops.

6.2.3.3.5.6 Verify X1 indicates 00005 on CRT.

[illegible] stops.

[illegible] lamp indications. Press [illegible] RESET.

6.2.3.3.6 Parity Fail

[illegible] the tape stops.

[illegible]

[illegible] tape stops.

[illegible] Not one bit that's not what one might [illegible] be inverted. Disregard all or any other alarm indications. Press [illegible] OR [illegible].

6.2.3.3.7 [illegible] FAIL ALARM

[illegible] tape stops.

6.2.3.3.7.1 [illegible]

[illegible]

6.2.3.3.7.2 [illegible]

6.2.3.3.7.3 [illegible]

6.2.3.3.7.4 [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] the following positions:

1. [illegible]
2. [illegible] MS A and MS B breakers ON (breakers pushed in).
3. [illegible]
4. [illegible] MS A and MS B breakers OFF (breakers pushed out).
5. [illegible]
6. [illegible] Video Power switch to ALL (up).

[illegible] positions:

1. [illegible]
2. [illegible]

[illegible] set to the following positions:

1. SLAVE TELESCOPE to STAR LOCK
2. OPTICS MODE to ZERO OPTICS
3. SPACECRAFT MODE to DIRECT
4. [illegible] to OC
5. Power and Proceedures to OFF
6. Alternate DEVICES ENABLE to OFF
7. PANEL BRIGHTNESS to maximum increase
8. DSS TIME MODE to AUTO OVERRIDE

[illegible]

[illegible]

[illegible]

[illegible] in the right hand circuit breaker panel (breakers

[illegible] be shorted (CB-239) [illegible]

[illegible]

[illegible] shall be 0.0 ± 1.0 degree.

[illegible]

6.2.6.1 [illegible]

6.2.6.2 [illegible]

[illegible] a minimum of 15 minutes before proceeding with this test.

[illegible] displayed on the CRT.

[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible] RMS	[illegible]
[illegible]	CG 1400	IMU 2V 25.6 KC [illegible]	+2.1 to +2.9 VRMS
[illegible]	CG 1401	OPTX 2V 25.6 KC [illegible]	+2.1 to +2.9 VRMS
[illegible]	CG 1201	IMU 28V .8 KC 1 PCT [illegible]	+27 to +29 VRMS
[illegible]	CG 1202	IMU 28V .8KC 5 PCT [illegible]	+26.1 to +29.9 VRMS
[illegible]	[illegible]	[illegible]	+24.7 to +30.3 VRMS
[illegible]	[illegible]	[illegible]	+26.1 to +29.9 VRMS
[illegible]	[illegible]	[illegible]	+27 to 29 VRMS
[illegible]	[illegible]	[illegible]	+26.1 to +29.9 VRMS
[illegible]	[illegible]	[illegible]	+15.6 to +24.4 VRMS

[illegible]

6.2.4.10.5 Perform 6.2.6 G&N Operational Test.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]

6.2.5.10 Set and verify all switches to normal.

6.2.5.11 [illegible]

[illegible]

6.2.5.13 [illegible]
(Tray 2 position) connector.

6.2.5.14 [illegible]
Panel to ON position.

6.2.5.15 [illegible]

6.2.5.16 [illegible]
Circuit Breaker Panel (breakers pushed in).

6.2.5.17 [illegible]

6.2.5.18 Insert the following into LEB DSKY:

Insert VERB 21, NOUN 02 and ENTER
Insert 00041 and ENTER
Insert 00000 and ENTER

[illegible]

position and PWR switch to 1 position.

shall clear.

after each insertion. Wait 60 seconds before proceeding.

5.2.5.30 IMU Fail (CI 590).

Pull the next switch.

1. MICROSYN EXCITATION
2. WHEEL EXCITATION
3. MG SERVO ERROR
4. MG SERVO ERROR
5. OG SERVO ERROR

Condition	Main Annunciator Panel	Display Panel	Event Module	CKT	Event Recorder
IMU FAIL	IMU FAIL	IMU FAIL	IMU FAIL		IMU FAIL
PGNS	*GEN ERROR	*FAILURE DETECT			ERROR DETECT
MASTER ALARM	MASTER ALARM	ERROR DETECT			

Otherwise the lamp remains lighted.

6.2.5.3.1.2

6.2.5.3.2 PITA 7001 (or 5000)

6.2.5.3.2.1

[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
		[illegible]
		[illegible] seconds.
		[illegible] lighted.
3.2.5.33.5	[illegible]	[illegible]
3.2.5.33.6	[illegible]	[illegible] seconds.
[illegible]	[illegible]	[illegible]
3.2.5.33.8	[illegible]	[illegible]
		[illegible] to 180 degrees. Wait 60 seconds.
3.2.5.33.9	[illegible]	[illegible]
	2.5.33.9	[illegible]
		[illegible] to 255 degrees. Wait 60 seconds.
3.2.5.33.12	[illegible]	[illegible]
	2.5.33.13	[illegible] seconds.
		[illegible] not lighted.

3.2.5.34 Removal of PSA Tray Extender Set

[illegible]	Perform 6.2.2.7 to Turn Off Gas System.

Procedure.

6.2.6.1 Initial Conditions

6.2.6.2

6.2.6.3

6.2.6.4

Item 12

Command System DCS || Item 2

ACU-8C Carry-on Junction Box
Item 13

FA Adapter Module
Item 14

External Digital Test Command Unit
Item 15

Data Interleaver System
Item 16

Electrical Cable Set
Item 17

6.2.7.2 [illegible]

6.2.7.3 [illegible]

6.2.7.4 [illegible]

6.2.7.5 [illegible] as displayed [illegible] size (CS 2393).

[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	105.7 to 25.3 VDC

[illegible]

6.2.7.6 [illegible]

6.2.7.7 [illegible]

6.2.7.8 [illegible] be the only [illegible] lamp lighted.

6.2.7.11 Proportional Note

[illegible] PROPORTIONAL position.

5.27.01 shall be as follows:

current is applied) (CO 2302).

current is applied) (CO 2303).

to 25.3 VDC (CO 2304).

CO 2301).

current is applied) (CO 2302).

current is applied) (CO 2303).

(3 modules packed).

in 5.27.01.1.

Slower the Procedure before proceeding.

This Test.

6.2.6.5.2 Set XIRE BACK to [illegible]

6.2.6.5.3 Set Function to [illegible]

6.2.6.5.4 Set NOZ to [illegible]

6.2.6.5.5 [illegible]

6.2.6.6 [illegible]

6.2.6.7 [illegible]

$$\frac{9600}{[illegible]} = 30.0000731 \text{ seconds, not less than}$$

$$= 29.9999269 \text{ seconds.}$$

[illegible] Reset

[illegible] troling the illumination of the following lamps:

- Optical Reticles
- Telescope Angle Readouts
- DMU-CDU Difference Display
- CORRS ALIGN MODE lamp on DMU Control Panel
- CDU Displays

[illegible]

- [illegible]
- CORRS ALIGN
- CDU PAD
- [illegible]
- [illegible]
- [illegible]

[illegible] lamp on the DMU Control Panel [illegible]

[illegible] the position, the check computation lamps [illegible]

- [illegible]
- [illegible]
- [illegible]
- [illegible]

[illegible]

[illegible] Control Panel to set to COMPUTER.

[illegible]

Return the selector to MANUAL.

[illegible] ensure that the system is in Coarse Align Mode under AGC control.

6.2.10.4 Trunnion CDU Servo Loop Check

6.2.10.4.1 [illegible] and the CONTROLLER MODE switch to DIRECT.

[illegible] channel of the Analog Recorder (AA1-AA3).

6.2.10.4.2 [illegible]

CG 3104 EXT.TRUN MDA INPUT INPHASE

6.2.10.4.3 [illegible] INPHASE.

6.2.10.4.4 [illegible] INPHASE shall be 1.25 ± 25 VRMS.

6.2.10.4.5 Set the CONTROLLER SPEED selector to LOW.

6.2.10.5 Shaft CDU Servo Loop Check

channel of Analog Recorder 141-403.

6.2.10.7.2 [illegible]
[illegible] 8000X or 7000X on CRT.

6.2.10.7.3 [illegible]

a. VERB 21, NOUN 01, ENTER
b. 00721, ENTER
c. 00000, ENTER

6.2.10.7.4 [illegible]

6.2.10.7.5 Enter the following sequence into the K14:

a. VERB 21, NOUN 01, ENTER
b. 00744 ENTER

6.2.10.7.6 [illegible]
0.006 degrees and stop.

6.2.10.7.7 [illegible]
[illegible] select to MANUAL.

6.2.10 [illegible]

6.2.11.1 [illegible]

[illegible] set to DIRECT.

[illegible]

6.2.11.2 Slew Rate – High Speed

6.2.11.2.1 [illegible]

[illegible]

6.2.1.5 Silver Dots & Medium Speed

[illegible] location spot [illegible]

[illegible]	08	140	[illegible] CDU 16X RCS [illegible]
[illegible]	08	120	[illegible] TOUR 1X RCS [illegible]
[illegible]	08	130	[illegible] SMART 1/2X RCS [illegible]
[illegible]	08	220	SMART CDU 16X RCS [illegible]

[illegible]

[illegible] 15mM for more than twenty seconds.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

6.2.11.6 Use Rate - Low Speed

[illegible]

[illegible]

[illegible]

[illegible]

NOTE: Read and understand section 6.2.11.6.A before proceeding. Do not hold control stick [illegible] upper limit for more than thirty seconds.

[illegible]

[illegible]

6.2.11.6.1 [illegible]

[illegible]

[illegible]

6.2.11.7 ACC Delay Timer.

[illegible] lamp has extinguished, set the selector to CONTROL.

[illegible]

[illegible]	[illegible]	[illegible]
D.	CS 3115, ECT, SHAFT TACH FEEDBACK	A13-A2-7-[illegible]
2.	CS 3134, ECT TURBINE TACH FEEDBACK	[illegible]
1.	CS 3126, ECT SHAFT TACH FEEDBACK	[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] [illegible]

[illegible] [illegible]

[illegible] [illegible] shall be the only MODE lamp illuminated.

[illegible] [illegible] COMPUTER.

[illegible] [illegible] the selector to MANUAL.

[illegible] [illegible] to DIRECT.

[illegible] Optical Coordinate Transformation Control Test

[illegible] [illegible] SPEED to LO to minimize drift.

[illegible] [illegible] control stick.

[illegible] Set the switches on the G&N Indicator Control Panel as follows:

a. CONTROLLER MODE to RESOLVED
b. CONTROLLER SPEED to HIGH

[illegible] [illegible] the K START and Command Module operators. Each should read and thoroughly understand this step before proceeding.

[illegible] [illegible] [illegible] shall be up to 6 seconds.

(a) Procedure, before processing:

Process Specification No. NA 6291-6036

[illegible] and to the Portable Lamp Assembly.

[illegible]

[illegible] position.

[illegible]

[illegible] follows:

a. CONTROLLER SPEED – MED
b. CONTROLLER MODE – DIRECT
c. SLAVE TELESCOPE – STAR LOS
d. OPTICS MODE – ZERO OPTICS

6.2.13.4 Resolution Check:

[illegible] to MANUAL position.

[illegible] pattern at the center of the field of view.

[illegible] number associated with each set of lines.

[illegible] view.

6.2.13.4.4 [illegible]

6.2.13.5 [illegible]

6.2.13.5.1 [illegible]

6.2.13.5.2 [illegible]

[illegible]

6.2.13.5.3 [illegible]

6.2.13.5.4 Repeat 6.2.13.5.1

[illegible]

[illegible] Turn on the light.

[illegible]

If needed to release external light, obtain, place, [illegible]

6.2.13.5.7 [illegible] The grips must be held in this position until [illegible] Step 6.2.13.5.12

6.2.13.5.8

6.2.13.5.9

6.2.13.5.10

6.2.13.5.11

6.2.13.5.15

6.2.13.6.1

6.2.13.6.6 [illegible]

6.2.13.7 [illegible]

6.2.13.7.1 [illegible]

6.2.13.7.2 [illegible]

6.2.13.7.3 [illegible] display on CRT shall stop flashing.

6.2.13.7.4 [illegible] Record the value of the SHAFT and TRUNNION CDU counters in R1 and R2 on CRT.

6.2.13.7.5 Record SHAFT and 2X TRUNNION CDU indications.

6.2.13.7.6 [illegible] is extinguished, return selector to MANUAL.

6.2.13.7.7 [illegible] to the values recorded in 6.2.13.1.8.

6.2.13.7.8 Record the value of the SHAFT and TRUNNION CDU counters in R1 and R2 on CRT.

6.2.13.7.8.1 [illegible] ± [illegible].

NOTE: [illegible]

6.2.13.7.9 [illegible] SHAFT ANGLE [illegible] Qualification Test [illegible] of coincidence [illegible]

NOTE: [illegible]

6.2.13.7.10 Record [illegible] as indicated [illegible] 2X [illegible]

[illegible]

[illegible]

[illegible]

6.2.13.7.2[illegible] [illegible] Press START pushbutton.

6.2.13.7.2[illegible] [illegible] (6.2.13.[illegible]) [illegible] Sec. [illegible] [illegible] select the [illegible]

[illegible] Set [illegible] lamp is extinguished, [illegible]

6.2.13.7.3[illegible] Enter V25 A1 [illegible]

6.2.13.7.3[illegible] [illegible] Press [illegible]

6.2.13.7.3[illegible] [illegible]

6.2.13.7.3[illegible] [illegible] (illegible) to [illegible]

[illegible] [illegible] [illegible] 6.2.14. Press ERROR pushbutton.

[illegible] [illegible] [illegible] 6.2.14. Press ERROR pushbutton.

[illegible] [illegible] Target No. 2 on A23-0/1. Record SHAFT and [illegible] CDU indications.

6.2.13.7-2.2.1

6.2.13.6
6.2.13.6.1

6.2.13.6.2

6.2.13.6.3

6.2.13.6.4

6.2.13.6.5

6.2.13.6.6

the 2X transition angle.

Remove the Portable Insert Assembly and Adapter Assembly from the test [illegible]

[illegible] selector to MANUAL position.

[illegible]

[illegible] Proceed with this test [illegible] operation has not been interrupted. If [illegible] been interrupted, perform 6.2.2.2 Turn On [illegible]

6.2.1.2 [illegible] that [illegible] which is the [illegible]

Verify that [illegible] IMU CONTROL panel [illegible] not lighted. [illegible] by pressing each button and lighted [illegible] NDI [illegible] shall remain lighted.

[illegible]

[illegible] Enter [illegible] Into [illegible] Press the [illegible] pushbutton.

[illegible] Enter [illegible] into [illegible] Press the [illegible] pushbutton.

[illegible] Enter [illegible] into [illegible] Press the [illegible] pushbutton.

[illegible] seconds.

[illegible] pushbutton. Record.

[illegible] degrees. Record.

[illegible]

[illegible] RELEASE on DSKY.

[illegible] CDU FAIL will momentarily lighted on Condition Annunciator Panel.

[illegible]

[illegible]. Record.

[illegible]

[illegible] proceedin[illegible]

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[illegible]

[illegible]

[illegible]

Table [illegible] Signal Voltage Requirements

[illegible]	[illegible] VRMS
[illegible]	[illegible]
[illegible]	[illegible] VRMS
[illegible]	[illegible] degrees
[illegible]	[illegible] degrees
[illegible]	[illegible] degrees
[illegible]	[illegible] degrees
[illegible]	[illegible] degrees
[illegible]	[illegible] degrees
[illegible]	[illegible] degrees
[illegible]	[illegible]

Table [illegible]

(Continued)

CS 2209 SCS PITCH	[illegible] degrees
CS 2230 SCS XAP BODY AXIS	[illegible] degrees
CS 2231 SCS YAS OFFSET AXIS	[illegible] degrees
CS 2232 SCS ROLL BODY AXIS	[illegible] degrees
[illegible]	[illegible]

[illegible] degrees.

[illegible] Verify that the X-RELAYS [illegible] indicate [illegible]

[illegible] Insert the following [illegible] in [illegible]

Insert VZSL,si,p SUM 50, ERTS

Insert 000000, ERTS

Insert 000000, ERTS

Wait 60 seconds.

Attitude Control Mode

[illegible] Insert the DCS [illegible] in the [illegible] of the [illegible] CAN [illegible]

[illegible] Log on TAPE READER, Console [illegible]

[illegible]

[illegible] are verified/[illegible] magnitude and polarity.

[illegible] Log [illegible] Chrome Process [illegible].

[illegible] Log for POWER/OF switch on CAN TAPE READER [illegible]

[illegible] Press the TAPE/KEY indicator to TAPE.

Press the FWD/REV indicator to FWD.

Press the IND/CONT indicator to CONT.

Press the LOAD/DEX indicator to LOAD.

NOTE: This Section initializes the MCC Loads the

Advances the GSE System [illegible] ZERO ENCODE Mode.

After the tape stops, the core, proceeding for ZERO ENCODE to [illegible]

[illegible] Press Error (+7/[illegible]).

[illegible] Verify [illegible] indicates [illegible]

Press the TMU/SCU pushbutton PB on the [illegible] and the [illegible] on AIGA-[illegible].

[illegible] Press Pen/oscillograph Recorder (AAI-A).

[illegible] indicates paper is not [illegible]

Tape stops.

Remove AIGA [illegible].

6.2.1.7.6.10 Verify Bridlemouse 0000h on CH2

NOTE: The readings of the Recorder and CRT must be taken immediately after the Bridlemouse has been set.

Tape stops.

Table XIII Signal Requirements

06 2207 SCS PITCH ERROR	[illegible] degrees
06 2241 SCS YAW OFFSET	[illegible] degrees
06 2271 SCS ROLL ERROR	111 to 1111 degrees

6.2.1.7.7 Bridlemouse (2) 0 and [illegible] degrees

Error on [illegible] CH1 or 2

Tape Stops.

6.2.1.7.8 Verify Bridlemouse 0000h on CH2

The readings of the Recorder and CRT must be taken

6:2:14:7:3:1: Record the [illegible]

6:2:14:7:6 [illegible]

Press the [illegible]

Tape:stops.

6:2:14:7:6:1 Verify 3U indicator [illegible]

NOTE: The readings for the Recorder [illegible] 6:2:14:7:6:7 must be taken [illegible] Translator have [illegible]

Tape:stops.

[illegible]

Table 2-1	Engine Requirements
[illegible]	[illegible]
CG 220, SCS PITCH, POS	[illegible] degrees
CG 221, SCS YAW, POS	[illegible] degrees
CG 222, SCS YAW OFFSET	[illegible] degrees
CG 223, SCS ROLL, POS	[illegible] degrees
CG 224, SCS ROLL OFFSET	[illegible]

[illegible]

[illegible]

[illegible] After the transfer of have [illegible] the initial [illegible] values [illegible] Record phase.

[illegible]

on the CRT and shown in Table [illegible]

Table [illegible]

[illegible]	[illegible]
[illegible] SCS PITCH ERROR	[illegible] degrees
[illegible] SCS YAW BODY	[illegible] degrees
[illegible] SCS YAW OFFSET	[illegible] degrees
[illegible]	
[illegible] SCS ROLL OFFSET	+[illegible] degrees

[illegible]

[illegible] Meter, the OUTER GIMBAL indicator on the IMU-CDU [illegible] Meter shall be [illegible] degrees.

[illegible]

Verify RI indicator [illegible] on.

[illegible]

NOTE: [illegible] readings on the Recorder and Cue must be taken [illegible] the transfer of have [illegible].

Press the RI indicator switch on [illegible] to [illegible]. Wait [illegible] seconds.

After the transfer have [illegible] the recorder [illegible].

Release [illegible] Record [illegible].

Table XV on the CKT.

Table XV	Signal Requirements
[illegible] SCS PITCH ERROR	[illegible] degrees
[illegible] SCS YAW DOT	[illegible] degrees
[illegible] SCS YAW OFFSET	[illegible] degrees
[illegible] SCS ROLL OFFSET	[illegible] to [illegible] degrees

Difference Never exceeds [illegible] degrees.

[illegible] Pitch Error [illegible] degrees.

Error on [illegible]

[illegible] degrees.

[illegible] Verify [illegible] indicator [illegible]

Note for [illegible] records. The DH will then proceed to [illegible]

CKT 6.2.16.8.2.7 must be recorded immediately after the translation [illegible]

[illegible] steps.

[illegible] Chapter 6, Section [illegible]

Signals in table XVI monitored by the [illegible]

Table XVI	Signal requirements
[illegible]	[illegible]
10 [illegible] SCS, Pitch [illegible]	[illegible] degrees

[illegible]

[illegible] Pitch error (12 degrees)

[illegible]

[illegible]

[illegible] Verify [illegible]

[illegible] must be taken immediately after [illegible] Abort [illegible]

[illegible]

[illegible] Record phase

the CG:

Table XVIII [illegible] Signal Requirements

[illegible]	[illegible]
CG 2209 SCS PITCH ERROR	+10.0 [illegible] degrees
CG 2239 SCS YAW BODY	0 ± 1.00 degrees
CG 2249 SCS YAW OFFSET	0 ± 1.00 degrees

(degrees).

until tape stops.

[illegible] CONTROL PANEL:

indicates 0 ± 0.100 degrees.

Gimbal Friction Test

Install on TAPE READER.

the following steps on Console [illegible] in sequence:

Press the TAPE/KEY indicator to TAPE.

Press the FWD/REV indicator to FWD.

Press the IND/CONT indicator to CONT.

Press the LOAD/INH indicator to LOAD.

CG 2110 IGA TM [illegible]

CG 2140 MGA TM [illegible]

CG 2170 OGA TM [illegible]

6.2.15.4 Press RUN Indicator

6.2.15.5 Press RUN Indicator

6.2.15.6 Press RUN Indicator

6.2.15.7 Start Analog Recorder AAI-A3 on K-148 to initiate the Friction Test. 9 minutes observe, CW changing, stop analog recorder when [illegible] 000 ± .010 degrees.

6.2.15.8 Repeat 6.2.15.5 and 6.2.15.6.

6.2.15.9 Start Analog Recorder AAI-A3 on Indicator on K-148 to initiate Friction Test.

[illegible] 000 ± .010 degrees.

Repeat 6.2.15.5 and 6.2.15.6.

[illegible] 000 ± .010 degrees.

Repeat 6.2.15.5 and 6.2.15.6.

6.2.15.10 Initiate CCW Counter-clockwise Friction Test.

[illegible] 000 ± .010 degrees.

Repeat 6.2.15.5 and 6.2.15.6.

[illegible]

Repeat 6.2.15.5 and 6.2.15.6.

remove from VAPI RADIO

Determine that none of the crews [illegible] 7.5 WDC for a period not to exceed [illegible] range on the active trace.

6.2.16.1 [illegible] proceeding.

Press RESET button on LCD DSU.

6.2.16.5 Power Global Response Test

on A41-A3-CB1.

6.2.16.5.3 [illegible]

6.2.16.5.7 [illegible]

Pull MS A's MS 3 circuit breaker on the right hand circuit breaker panel.

[illegible] switches on A42-A6-155 are

than 0.8 seconds

signals shall be two

6.2.16.5.2

6.2.16.6.8

6.2.16.6.9

6.2.16.6.10

6.2.16.6.8

[illegible]

[illegible] than 0.6 seconds.

6.2.16.6.5.2 [illegible] signals shall be two.

6.2.16.7 Outer Gimbal Response Test

[illegible]

6.2.16.7.2 Insert the following sequence into K148.

[illegible]	VERB 21, NOUN 20, ENTER	
[illegible]	+00000	ENTER
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

6.2.16.7.3 [illegible]

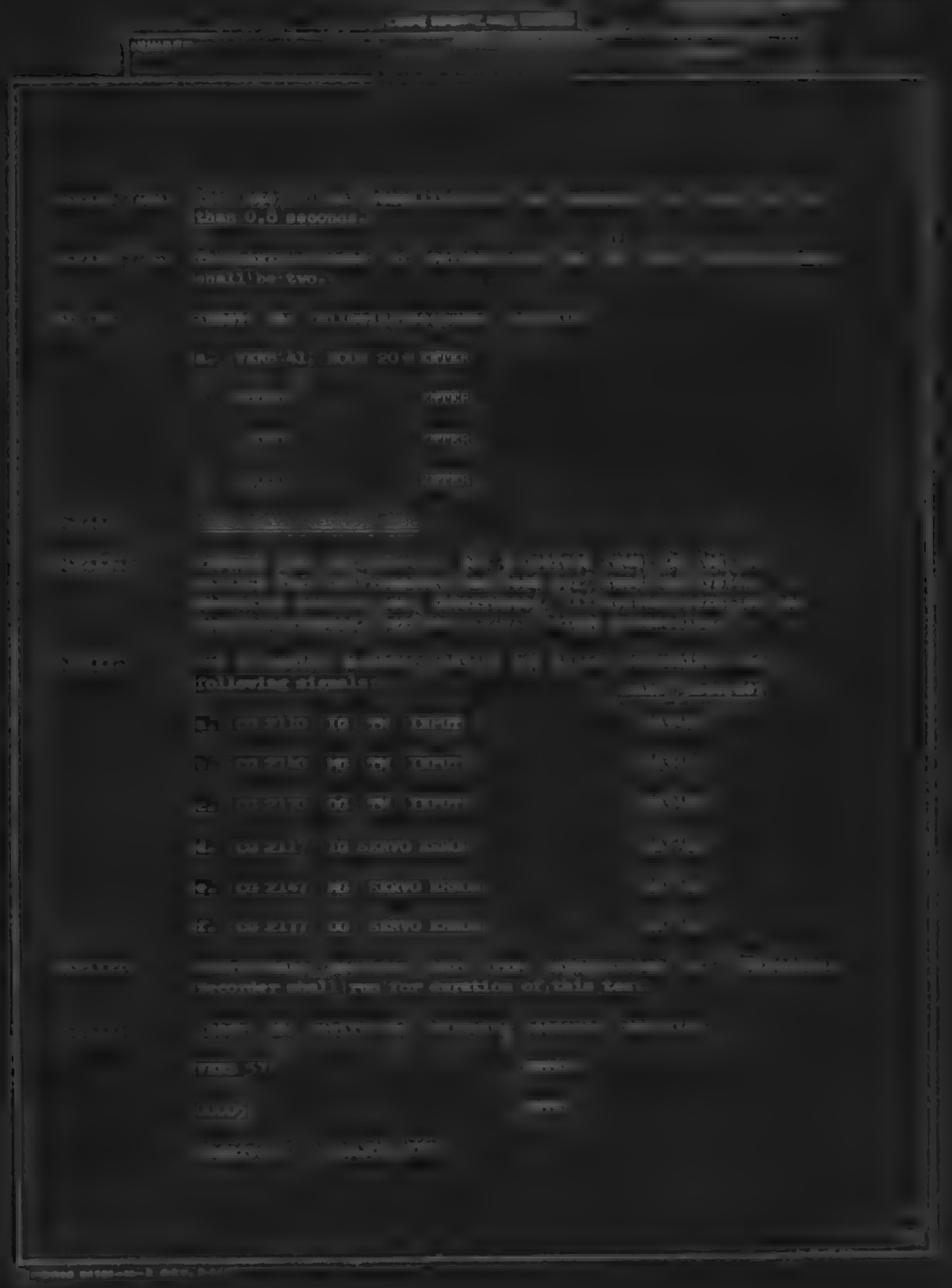
[illegible]

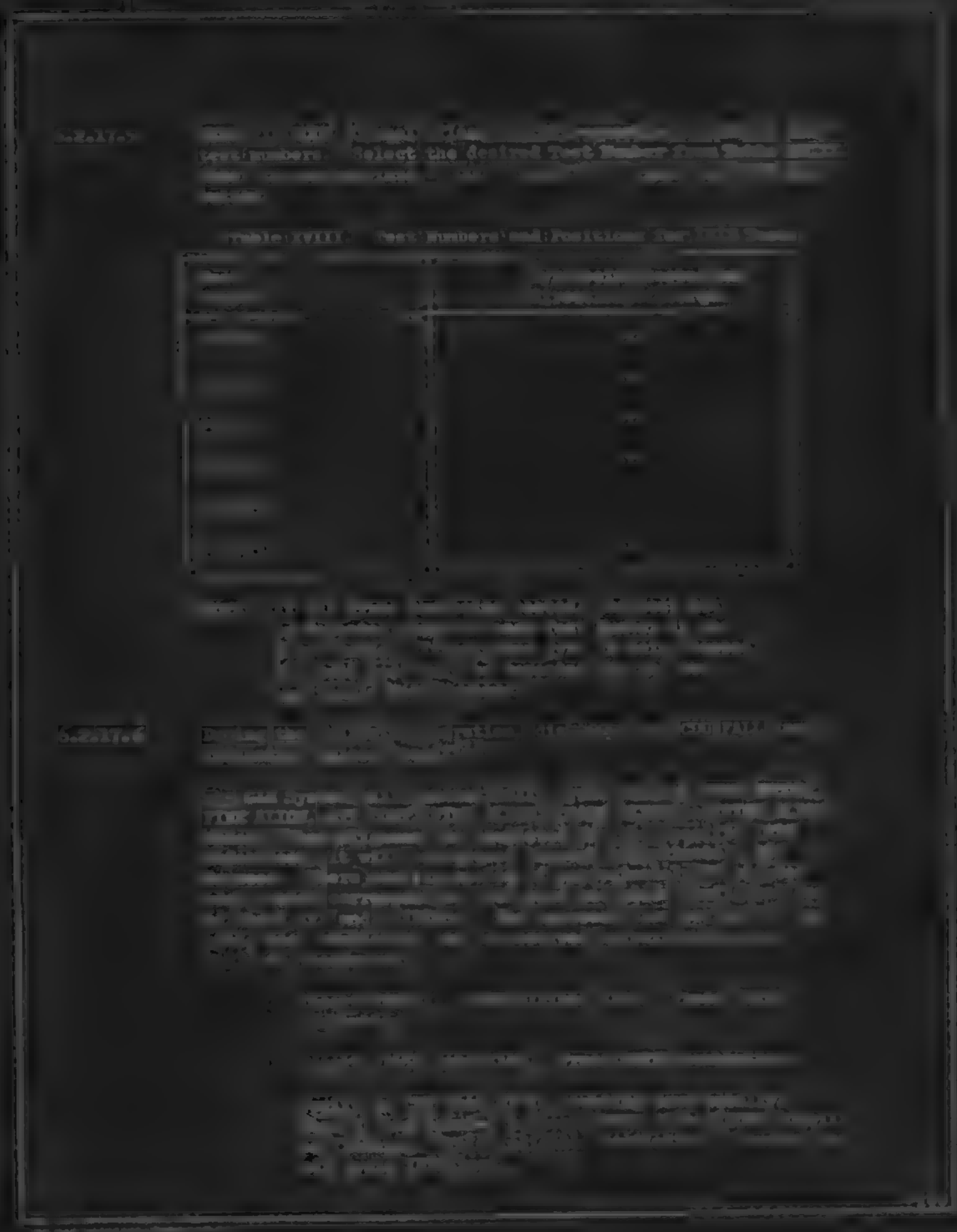
6.2.16.7.5 [illegible] Step into the OG Stabilization Loop.

[illegible] Right Hand Circuit Breaker, [illegible]

6.2.16.7.6 [illegible] Stabilization Loop.

[illegible] In addition, record the total number of over-





[illegible] appropriate Test Number in Table III.

Table III. Display of Test Parameters

[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

[illegible] the [illegible] section on the LEB ACC [illegible] Table XVIII have been utilized.

[illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] seconds.

[illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] after each entry.

[illegible]

a. X Axis Scale Factor Error

$$\frac{\Delta x_{23}}{\Delta x_{21}}$$

[illegible]

5.2.17.12 c. ZIRIG Scale Factor Error

[illegible] (parts/million)

[illegible] 1750 parts/million.

[illegible]

[illegible] for a minimum of one hour.

5.2.18 Test Initiation

[illegible]

Do VERB 37 ENTER

Do 00001 ENTER

Observe 07 in MAJOR MODE.

[illegible]

Proceed to 5.2.18.1.1.

[illegible]

Do VERB 21 ENTER

5X X 5XXX (Correct KB azimuth) ENTER

VERB 22 ENTER

5X0X23 (Correct KB latitude) ENTER

VERB 33 ENTER

indicate:

R1 = 00032 (RS Tilt angle)
R2 = 00000 (Test Index)
R3 = 0000X (Test Position)

Where X indicates positions 1 through [illegible]

[illegible]
Bypass.

[illegible]
Hold and proceed to 6.2.16.4.[illegible]

[illegible]

[illegible] VGOS 21, JOUR 02 [illegible]

[illegible]

+00032 (Correct RS tilt) [illegible]

VGOS 21, JOUR 02 [illegible]

01304 [illegible]

+00000 (Correct index) [illegible]

VGOS 21, JOUR 02 [illegible]

01305 [illegible]

+0000X (position) [illegible]

[illegible] VGOS 33 [illegible]

[illegible]
and MS COU engine.

[illegible]

If it is desired to [illegible]
[illegible] 33 [illegible]
[illegible] After completion of position [illegible]

[illegible] Alice made Jump small light.

62165 [illegible] Calculation

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as follows:

Position Number

[illegible] 5.03 cm/sec/pulse.

[illegible] and 6.2.18.5.2 as follows:

$$[illegible]$$

6.2.18.5.4.3 [illegible]

[illegible]	[illegible]
[illegible]	[illegible]

[illegible] calculations.

[illegible]

[illegible] Test

[illegible]

[illegible] axis.

6.2.19.4 [illegible]

6.2.19.5 [illegible] and test site latitude respectively.

[illegible] values

and proceed to 6.2.18

6.2.19.6 [illegible]

[illegible] X1 (correct RE azimuth) [illegible]

[illegible]

6.2.19.7 [illegible] indicating:

[illegible]

[illegible]

[illegible]

[illegible]

	VERB 21	NOUN 62	ENTER
	01313		ENTER
	±00000		ENTER
	VERB 21	NOUN 62	ENTER
	01314		ENTER
	±00000		ENTER
	VERB 21	NOUN 62	ENTER
	01315		ENTER
	±00000		ENTER
	VERB 33		ENTER

indicated on the IMU CONTROL Panel.

NOTE: (R) should be ± 00000.

[redacted]

[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]

[redacted] Approximately 20 seconds after the final entry, [redacted] the PROG ALTER mode (E below) perform [redacted]

[redacted]

[redacted] VERB 06 NOUN 20 ENTER

[redacted]

6.2.19.17

[illegible]

[illegible] (1) shall be known to ± 30 minutes of arc.

[illegible] (1) [illegible] for a minimum of one hour. System shall be in [illegible] COARSE ALIGN mode under computer control with [illegible] gimbal angles at zero.

[illegible] (2) [illegible] recorded in (5M).

[illegible] MANUAL.

[illegible] Initiate the test by inserting the following into K145:

VERB 57 [illegible] ENTER
Observe VERB 21 [illegible] NOUN 61 [illegible] flashing
[illegible] ENTER
Observe PROGRAM lights. [illegible] 67

[illegible] CONTROL panel light and then extinguish.

[illegible]

a. K1 = xxx.xx (45,000 ÷ S/C AZ degrees)
b. K2 = [illegible] (TGT 1 El, degrees)
c. K3 [illegible] (TGT number)

[illegible] K148 and proceed to 5.2.26.9.

[illegible]

a. VERB 21 [illegible] ENTER
b. ± xxx.xx (45,000 ÷ S/C AZ) ENTER

[illegible]

[illegible]

a) [illegible] (Y23.22) [illegible]

b) [illegible] (0000) [illegible]

c) [illegible] (Y23.33) [illegible]

[illegible]

a) [illegible] (-65.000 [illegible] S/C AZ degrees)

b) [illegible] (0000) (TGT. 2 EL. degrees)

c) [illegible] (0000) (TGT. number)

[illegible] Take 10.6 and proceed to 6.2.20.12.

[illegible]

a) [illegible] (Y23.21) [illegible]

b) [illegible] (-65.000 [illegible] S/C AZ) [illegible]

[illegible]

a) [illegible] (Y23.22) [illegible]

b) [illegible] (0000) [illegible]

c) [illegible] (Y23.33) [illegible]

[illegible]

a) [illegible] (1500) (SM A2)

b) [illegible] (20316) (LGC)

[illegible] Take 10.6 and proceed to 6.2.20.15.

[illegible]

a) [illegible] (Y23.21) [illegible]

b) [illegible] (1500) (correct SM A2) [illegible]

[illegible]

[illegible] 6.2.20.1 through 6.2.20.14.

6.2.20.27

6.2.20.28

6.2.20.29

6.2.20.30

[illegible] (Continued)

[illegible]

Turn On Procedure of 6.2.2.2 before proceeding.

[illegible]

the tape will initiate the Prelaunch Alignment Program.

[illegible]

on Right Hand Circuit Breaker panel.

[illegible]

changed by performing the following sequence.

[illegible]

[illegible] stored in erasable memory.

[illegible]

sequence into K14.

VERB	21	NOUN	02	ENTER
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
XXXXX	ENTER	(Octal data)		

[illegible]

Perform the following calculation:

$$\frac{[illegible]}{2^{28}} \times 180.54 = AAAAA.bbbbb$$

[illegible]

Dump K14:

VERB 21	NOUN 02	ENTER
01505	ENTER	
SAAAAA	ENTER	(S = sign)
VERB 21	NOUN 01	ENTER
01507	ENTER	
SBBBBB	ENTER	

[illegible]

b. Perform the following calculations:

[illegible]

6.2.21.5 Start [illegible]

[illegible]

6.2.21.6 Start the [illegible]

[illegible]

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[illegible]

[illegible]

Press the KEY RELEASE Publication on the 1st [illegible]

[illegible]

Each time that a [illegible] is completed, [illegible] in Table 6-2.

[illegible] in Table 6-2.

[illegible]

[illegible] each data set. Record in Table 6-2.

6.2.21.25.1 The following lamps on Event Module 4A3A5E1 shall be lighted:

SIGNAL

a. 28 V DC AGC
b. 28 V DC OPERATE/IMU
c. 28V DC OPTICS

6.2.21.25.2 Record voltage readings on the CRT of the following signals on the data sheet:

Measurement List No.		Signal			Requirement
a.	CG 1400	IMU 2.5 V	25.6 KC	Supply	2.1 to 2.9 VRMS
b.	CG 1401	GPT 2.5 V	25.6 KC	Supply	2.1 to 2.9 VRMS
c.	CG 1301	IMU 2 V	3200 CPS	Supply	2.9 to 4.10 VRMS
d.	CG 1101	-28 VDC	ELECTRONIC		-33.7 to -21.3 VDC
e.	CG 1030	+3 VDC	AGC	Supply	+1.88 to 4.12 VDC
f.	CG 1020	+13 VDC	AGC	Supply	+11.7 to +14.3 VDC
g.	CG 1201	IMU 28 V	800 CPS	1% 0°	27.0 to 29.9 VRMS
h.	CG 1203	IMU 28 V	800 CPS	5% 0°	24.7 to 30.3 VRMS
i.	CG 1202	IMU 28 V	800 CPS	5% -90°	26.1 to 29.9 VRMS
j.	CG 1204	CDU 28 V	800 CPS	5% -90°	26.1 to 29.9 VRMS
k.	CG 1211	GPT 28 V	800 CPS	1% 0°	27 to 29 VRMS
l.	CG 1212	GPT 28 V	800 CPS	5% -90°	26.1 to 29.9 VRMS

6.2.21.25.3 Repeat steps 6.2.21.23.1 through 6.2.21.23.3 three times thirty minutes after adjustment of the G&N input voltage to 26.1 volts dc.

6.2.21.25.4 Repeat steps 6.2.21.23.1 through 6.2.21.23.3 three times one hour after adjustment of the G&N input voltage to 26.1 volts dc. Record the data as data set 6 in Table 6.2 and calculate and record the average values.

6.2.21.26 Save the input voltage to the G&N system adjusted to 31.3 volts dc for a period of one hour.

6.2.21.26.1 The following lamps on Event Module 4A3A5E1 shall be lighted:

SIGNAL

a. 28 V DC AGC
b. 28 V DC OPERATE IMU
c. 28 V DC OPTICS

6.2.21.26.2 Record the voltage readings for the signals listed in 6.2.21.25.2. The requirements shall be those listed in 6.2.21.25.2.

6.2.21.26.3 Repeat steps 6.2.21.23.1 through 6.2.21.23.3 three times thirty minutes after adjustment of the G&N input voltage to 31.3 volts dc. Record the data as data set 7 in Table 6.2 and record the average values.

6.2.21.26.4 Repeat steps 6.2.21.23.1 through 6.2.21.23.3 three times one hour after adjustment of the G&N input voltage to 31.3 volts dc. Record the data as data set 8 in Table 6.2 and calculate and record the average values.

6.2.21.27 Have the input voltage to the G&N system adjusted to 28 volts dc.

6.2.21.28 Enter the following into the KL48:

VERB 37	ENTER	
00	ENTER	
VERB 40	NOUN 20	ENTER wait 90 seconds
VERB 41	NOUN 20	ENTER
+00000	ENTER	
+00000	ENTER	

6.2.21.29 Verify that COARSE ALIGN is the only mode lamp lighted on the IMU Control Panel.

6.2.21.30 Pull out OPTICS MN A and MN B breakers on Right Hand Circuit Breaker panel.

TABLE 6.1

Time	CSU Dial Readings		
Minutes	OG	IG	MG
0			
15			
30			
45			
60			
75			
90			
105			
120			
135			
150			
165			
180			
195			
210			
225			
240			
255			
270			
285			
300			

TABLE 6.2

Data Set	X Gyro Torquing Angle (R1)				Y Gyro Torquing Angle (R2)				Z Gyro Torquing Angle (R3)			
	First Reading	Second Reading	Third Reading	Average	First Reading	Second Reading	Third Reading	Average	First Reading	Second Reading	Third Reading	Average
1												
2 (2 hours)												
3 (2.5 hours)												
4 (3.0 hours)												
5 (Lo Bus)												
6 (Lo Bus)												
7 (Hi Bus)												
8 (Hi Bus)												